Radiologic Assessment of Gastrointestinal Bleeding

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KEYWORDS

• Obscure GI bleeding • Occult GI bleeding • Overt GI bleeding

KEY POINTS

- Gastrointestinal bleeding can be classified into overt, occult, and obscure, depending on clinical presentation, as well as by anatomic location of the source of bleeding.
- The radiologic imaging modalities evaluating overt bleeding are computed tomography (CT) angiography, conventional angiography, and nuclear scintigraphy.
- Imaging workup of occult bleeding mostly involves evaluation of the small bowel with CT enterography, and in some cases, Meckel scan.
- The evaluation of obscure bleeding is variable based on clinical status and provider preference.

Gastrointestinal (GI) bleeding is not a singular disease but a symptom and clinical manifestation of a broad range of diseases of the GI tract. The approach to the treatment and management of GI bleeding is variable and depends on the site and rate of bleeding and the clinical presentation. Patients are categorized based on the location of the source of their bleed and the overall acuity of their symptoms. These distinctions help triage and guide management and treatment strategies and also carry important epidemiologic and prognostic considerations.

When classifying GI bleeding anatomically, patients with upper GI bleeding—a bleed proximal to the ligament of Treitz, which connects the fourth portion of duodenum to the diaphragm—classically present with coffee-ground hematemesis, bright red hematemesis, melena, or even hematochezia when the hemorrhage is brisk and severe. On the other hand, lower GI hemorrhages—bleeds involving the jejunum, ileum, colon, and rectum—typically present with melena or hematochezia. The overlap between upper versus lower GI bleeds who present with melena or hematochezia may further be delineated when considering melena as an indication of intraluminal blood products that have been present within the GI tract for at least 8 hours and is 4 times

Disclosure Statement: The authors have nothing to disclose.
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Gastroenterol Clin N Am ■ (2018) ■–■
https://doi.org/10.1016/j.gtc.2018.04.003
gastro.theclinics.com

more likely to arise from an upper GI source; hematochezia, which indicates a brisk severe upper GI bleed or a lower GI bleed, is 6 times more frequent in the setting of a lower GI bleed.[1] In addition, about 75% of patients with acute GI bleeds present with an upper GI source.[2]

Apart from categorizing bleeding with anatomic landmarks, bleeds can also be classified on their clinical presentation. Overt GI bleeding refers to visually apparent bleeding, such as hematemesis and hematochezia, whereas occult GI bleeding alludes to a positive fecal occult blood test (FOBT) and/or iron deficiency anemia without visible evidence of hemorrhage.[3] Furthermore, the term obscure GI bleeding refers to patients with recurrent bleeding of uncertain cause after full diagnostic evaluation of the bowel. In these situations, obscure GI bleed may be overt, when presenting with frank visible blood, or occult.

ACUTE GASTROINTESTINAL BLEEDING

Acute GI bleeding is a common medical emergency with an annual incidence of 40 to 150 episodes per 100,000 people for upper GI bleeds and 20 to 27 episodes per 100,000 people for lower GI bleeds.[4] There is a male predilection with acute GI bleeding being twice as common in men than in women. There is also an increase in incidence with increasing age, with 70% of patients with acute GI bleeding being older than 65 years.[5,6] This important epidemiologic factor lends itself in consideration of localizing the GI bleed. Younger patients are more likely to have upper GI bleeding and older patients are more likely to have lesions in the lower GI tract.[7] Prompt clinical evaluation, hemodynamic stabilization, and treatment are necessary because mortality can be as high as 40% in patients with hemodynamic instability.[8] Hypotension and tachycardia can occur with as little as 500 mL of acute blood loss and hypovolemic shock with as little as 15% of loss of the total circulating blood volume.[9]

CLINICAL APPROACH AND IMAGING CONSIDERATIONS FOR ACUTE GASTROINTESTINAL BLEEDING

Rapid assessment of a patient presenting with symptoms related to a GI bleed is crucial because the clinical status of the patient helps guide the priority and choice of diagnostic and therapeutic management strategies.[4] Hemodynamic instability due to blood loss supersedes the priorities of any diagnostic and therapeutic procedures. Patients who present with a hemoglobin level of less than 7 g/dL should be transfused to maintain hemoglobin levels of 9 g/dL. In addition, patients who are found to be coagulopathic and/or thrombocytopenic should be considered for transfusion with fresh frozen plasma and platelets, respectively.[10] However, if the patient presents with large volume blood loss and is clinically unstable despite resuscitation efforts, urgent exploratory surgery is often indicated to perform, for example, a partial gastrectomy to treat a bleeding gastric ulcer.[11]

Once the patient is clinically stable, efforts to localize the source of the hemorrhage can be undertaken. Traditionally for acute upper GI bleeds, endoscopic procedures, specifically esophagogastroduodenoscopy, provide sensitivity and specificity of 98%.[3] Unfortunately, implementation of endoscopy in an emergent setting poses a variety of logistical challenges, such as availability of anesthesia and gastroenterologists and their support staff. In addition, obscuration of the mucosa due to intraluminal blood and intestinal contents and extent of evaluation of the distal duodenum and small bowel pose technical challenges.[12] Colonoscopy to evaluate for distal lower GI tract lesions is successful in about 13% of cases in some series.[13] The same logistical and technical challenges remain with the added necessity for bowel preparation.